Roadmap to Data Integrity: Practical Data Validation, Verification, and Security Controls

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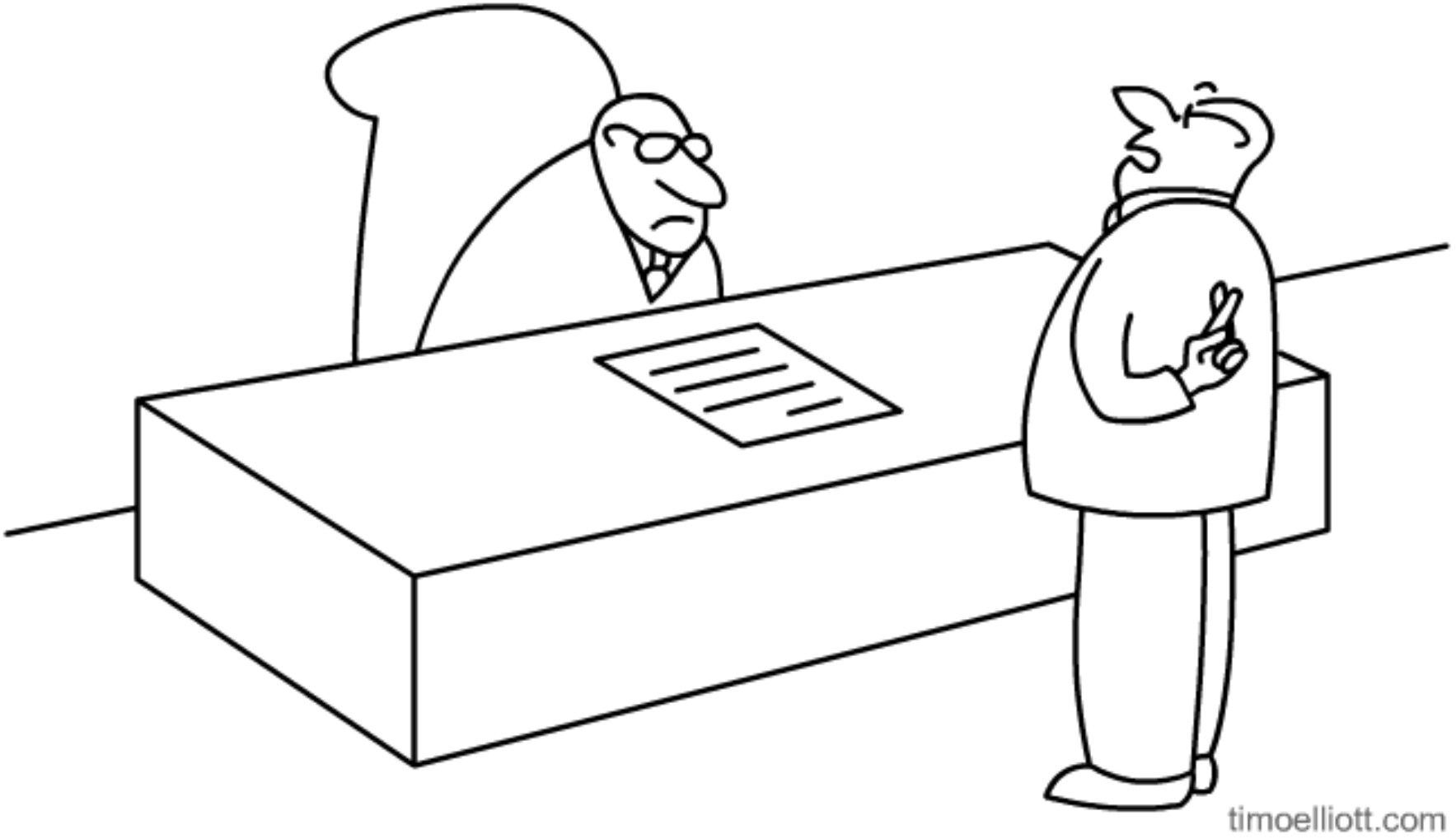
What is Data Integrity?



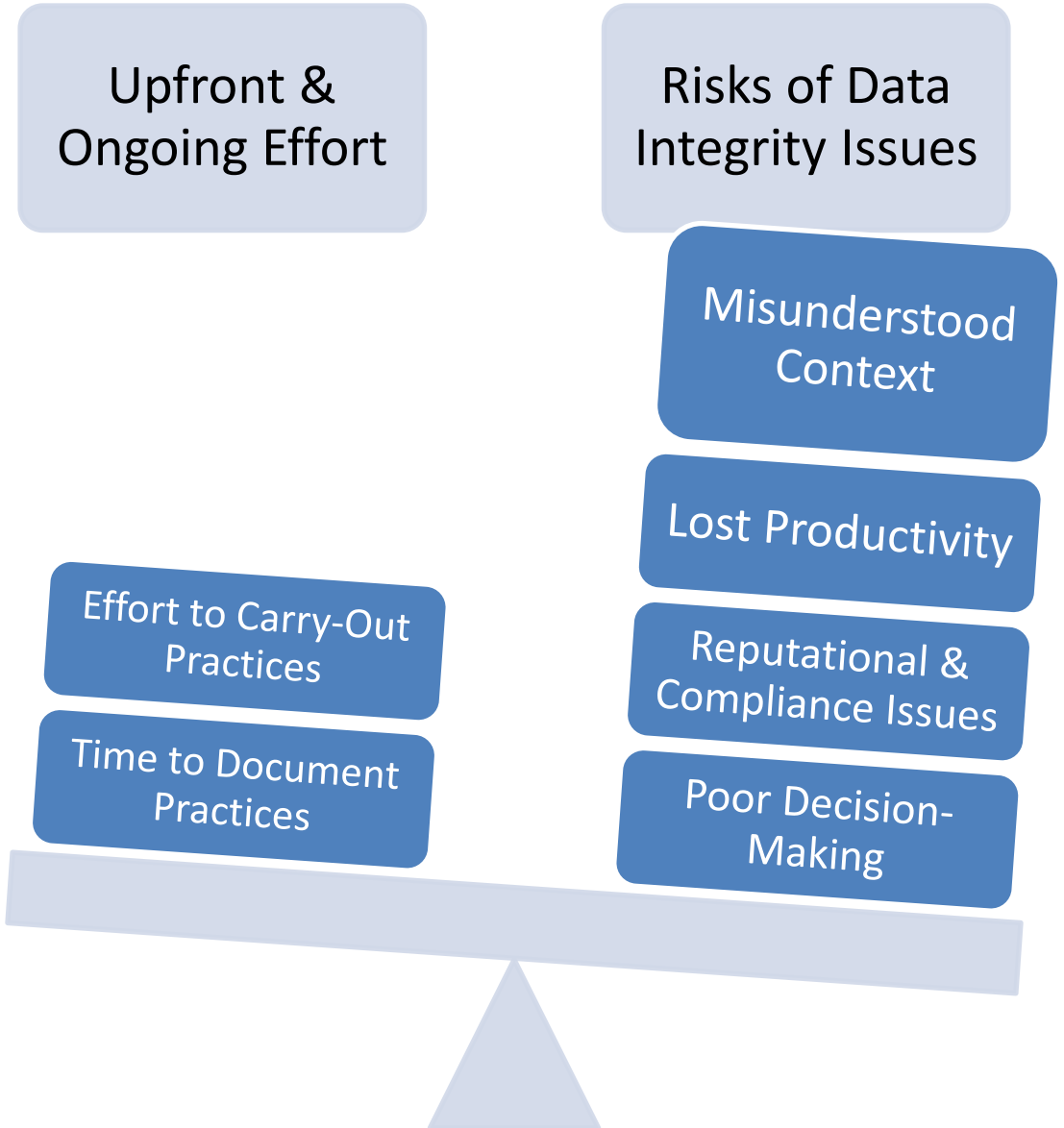
"Yes sir, you can absolutely trust those numbers"

Data Integrity – Multiple Dimensions

Emory Policy – Institutional Data Management says that "data integrity" is composed of:

- **Accuracy:** *Data free from errors*
- **Completeness:** *All values are present.*
- **Consistency:** *Data satisfy a set of definitions or constraints that applied and maintained in the same manner across reports*
- **Reliability:** *Independent custodians or users obtain consistent results when applying the same definitions or constraints.*
- **Timeliness:** *Data are available when required.*

Why Does Data Integrity Matter?



Examples of Data Integrity & Quality Issues

Promoting Data Integrity = Validation + Verification + Security

(1) Data validation – *"The computer checks if the data is **correct and makes sense** (e.g., correct format, length, etc.)."*

(2) Data verification and approval – *"People step-in to confirm that the data is **reliable and accurate** (e.g., reported data matches source data, etc.)."*

(3) Data security – *"People limit access to data sets, systems, and spreadsheets to only those **with a need to know** (e.g. formal user access request process, access terminations, audit logs)."*

Data Integrity – Key Controls for Your Unit/Department

(1) Document your unit's data management procedures and controls:

- Data validation,
- Data verification, and
- Data security

** Include source systems for data, where data is downloaded into (e.g., spreadsheet), who has access, how data is manipulated/edited to meet context of questions being asked, who reviews/approves it before submission to report preparer (e.g., Institutional Research) for reporting, etc.*

(2) Carry-out and implement unit-level controls.

(3) Maintain evidence of unit-level controls.

(2) Carry-out validation, verification, and security controls:

	Data Milestone	Examples of controls – validation, verification, and security
(1)	Before, during and after data input/capture	(a) Control access to spreadsheets and data systems (b) Enable system/spreadsheet audit logs to track changes (c) System/spreadsheet edit checks (prevent wrong data element type, range, etc.) (d) Designate independent reviewers to confirm correct capture (e) For automated feeds, establish a transfer log/record count check
(2)	After extraction from storage	(f) Perform reconciliation – manual or automated - between data extracted versus data source (entire population or sampling)
(3)	After compilation for reporting purposes	(g) Agree on context and usage of data (Institutional Research and data owner/supplier) (h) Retain supporting data sets/results that substantiate reported values (i) Establish documented unit-level (data owner/supplier) *data verification and approval process,* which is relied upon by the report preparer (e.g., Institutional Research, who performs a direct query of your data OR receives a spreadsheet/data file from your unit).
(4)	Published data	(j) Perform a post-publication review that data published was the data agreed upon.

(3) Maintain evidence of unit-level data validation, verification, and approval process

Examples of evidence include:

- Unit-level approval support (e.g., emails string from designated department level reviewers/approvers)
- Hardcopy sign-off approvals on forms maintained, etc.
- Approvals should be supported by retention of query and results supporting the submitted data.

Questions?